Carmel Clay Comprehensive Plan

C3 PLAN 2008

PART 4

PART 4: TRANSPORTATION PLAN

TRANSPORTATION PLAN INTRODUCTION

Part 4: Transportation Plan is inclusive of vehicular, bicycle, pedestrian, and mass transportation. The City of Carmel recognizes that improving and establishing multiple modes of transportation is essential to further its evolution to a high quality edge city.

The *C3 Plan* is the first of its kind to be inclusive of all mainstream transportation modes. The City is making the conscious decision to emphasize alternative modes of transportation to complement traditional vehicular transportation. Alternative transportation is increasingly desirable because residents want bicycle and pedestrian connectivity (e.g. side paths) to local amenities, commuters want alternatives (e.g. light rail) for travel to work, and life-style changes are demanding more recreational facilities (e.g. Monon Greenway).

To address each mode of transportation, this Part is divided into the following three sections:

Thoroughfare Plan

The Thoroughfare Plan identifies and describes the recognized street classifications. It also includes the 20-Year Thoroughfare Plan Map which applies those street classifications to every street in Carmel's planning jurisdiction. The application of street classifications is designed to result in the effective connectivity and efficient flow of traffic.

Bicycle and Pedestrian Facility Plan

The Bicycle and Pedestrian Facility Plan identifies and describes the facilities designed for bicycle and pedestrian use. It also includes the Bicycle and Pedestrian Facility Plan Map which denotes where each type of facility is intended to be installed or maintained to achieve effective connectivity.

Transit Plan

The Transit Plan identifies and describes the transit system and facilities desired by the City of Carmel. The transit system is currently in the planning stages, so the content of this Plan is meant to support the ongoing desire to establish a commuter line to downtown Indianapolis and intra-city transportation.

PART 4: TRANSPORTATION PLAN

THOROUGHFARE PLAN

The City's 20-Year Thoroughfare Plan focuses on facilities for motor vehicles, streets, and alternative transportation systems. The Thoroughfare Plan first identifies and describes recognized street classifications. It then applies those street classifications to every street in the City's planning jurisdiction on the Thoroughfare Plan Map.

Street Classifications and Descriptions

The following street classifications are used on the Thoroughfare Plan Map:

Each of the street classifications listed above has a page dedicated to describing how it can be used to convey vehicular traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each street classification:

General Description: This section gives a brief description of why the street classification has been established.

Street Features: This section conveys the primary design standards that make each street classification unique. The standards include: right-of-way, maximum number of lanes, minimum lane width, curbs, sidewalks and paths, on-street parking, street trees, and buffer plantings.

Typical Cross Section: This section references a typical cross section illustration of the street classification. The illustration is intended to portray the purest applied version of the street. When applied in the real world, variations in the design maybe necessary.

Design Priorities: During the design phase of all street improvement projects, decisions have to be made to best meet budgetary constraints, timelines, funding cycles, physical constraints, and political constraints. This section communicates the primary and secondary priorities for each street classification. Primary priorities are those that should not be foregone in design decisions. Secondary priorities are those that may be considered for compromise, non-inclusion, or later phases of the project.

Traffic Management Options: This section describes vehicular traffic management options to consider when improving a street. The options listed are intended to identify the most appropriate means to intersect streets, slow traffic (if appropriate), increase traffic efficiency (when appropriate), and improve safety.

RESIDENTIAL STREET - LANE

General Description

A Residential Street - Lane is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 40 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 10 feet
- **Curbs:** Not required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not permitted
- **Minimum Tree Plot:** 5 feet
- **Street Trees:** Required
- **Buffer Planting:** Not required

Typical Cross Section

See illustration below

Design Priorities

- **Primary Priorities:**
  - Access to residential properties
  - Reinforce neighborhood character
  - Connect bicycle and pedestrian facilities from cul-de-sacs
  - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
  - Width of travel lanes

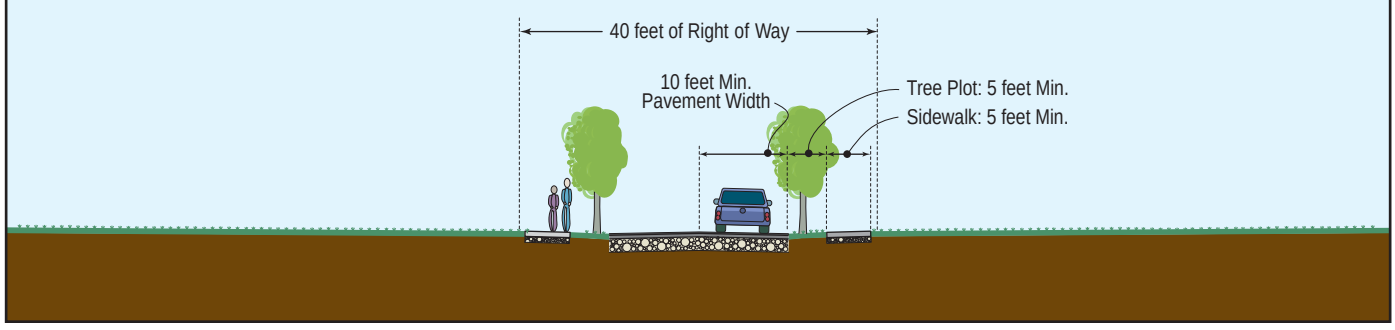
Traffic Management Options

- Roundabouts
- Narrower lane widths
- Signs

The frontage street along 126th Street pictured above with single-sided sidewalks is an example of a Residential Street (Lane).

Carriage Lane pictured above is another example of a Residential Street (Lane).

Residential Street - Lane Typical Cross Section



RESIDENTIAL STREET - MINOR

General Description

A Residential Street - Minor is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 50 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one side; 7 feet each
- **Minimum Tree Plot:** 5 feet
- **Street Trees:** Required
- **Buffer Planting:** Not required

Typical Cross Section

See illustration below

Design Priorities

- **Primary Priorities:**
  - Access to residential properties
  - Reinforce neighborhood character
  - Connect bicycle and pedestrian facilities from cul-de-sacs
  - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
  - Width of travel lanes
  - On-street parking

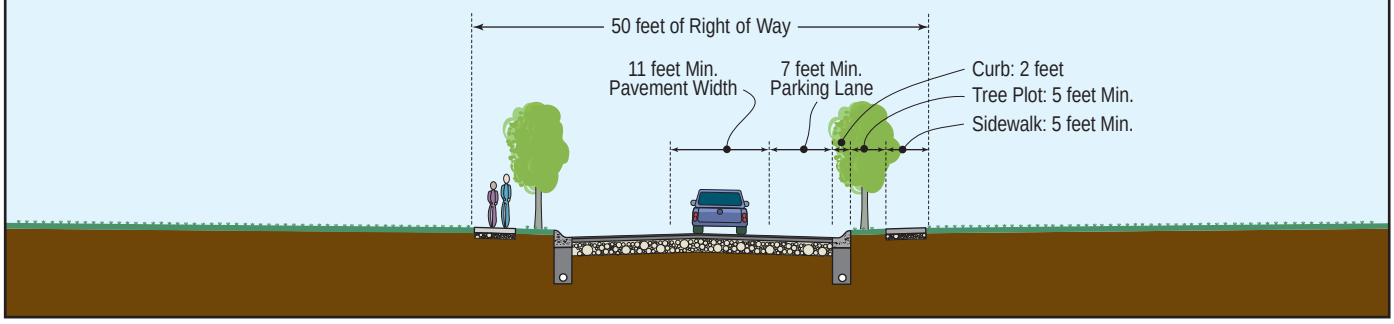
Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Signs

Although configured as an urban street (with no tree plot), 1st Street SE represents the right scale and right-of-way for a Residential Street (Minor).

Chauncy is a newer example of a Residential Street (Minor) with small tree plots and narrow right-of-way.

Residential Street - Minor Typical Cross Section



RESIDENTIAL STREET - MAJOR

General Description

A Residential Street - Major is designed primarily to provide access to platted residential lots and remote properties. These streets generally connect with Collector Streets and other Residential Streets. Residential Streets may include non-through streets.

Street Features

- **Minimum Right-of-Way:** 55 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Widths:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one side; 7 feet each
- **Minimum Tree Plot:** 5 feet
- **Street Trees:** Required
- **Buffer Planting:** Not Required

Typical Cross Section

See illustration below

Design Priorities

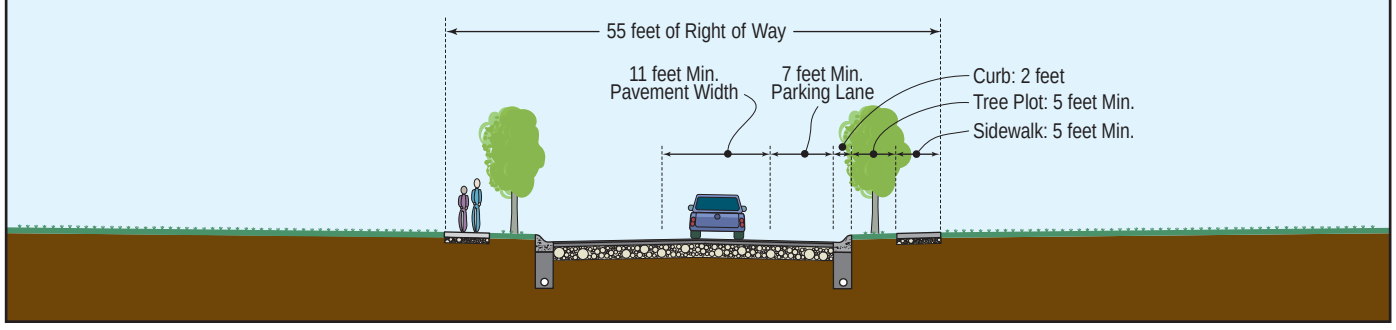
- **Primary Priorities:**
  - Access to residential properties
  - Reinforce neighborhood character
  - Connect bicycle and pedestrian facilities from cul-de-sacs
  - Properly installed and designed pedestrian facilities
- **Secondary Priorities:**
  - Width of travel lanes
  - On-street parking

Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Signs

Lakeshore East is an existing Residential Street with curbs, gutters, and sidewalks on both sides of the street.

Residential Street - Major Typical Cross Section



COLLECTOR STREET

General Description

A Collector Street is designed to allow direct residential driveway access and allow on-street parking when deemed safe. These streets primarily connect Residential Streets with Residential Parkways, Secondary Parkways, and Secondary Arterials.

Street Features

- **Minimum Right-of-Way:** 90 feet; 80 feet in areas south of 116th Street and west of Spring Mill Road.
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 7 feet each
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Neighborhood character
- Bicycle and pedestrian facilities
- Street trees

Secondary Priorities Within Right-of-Way

- Width of travel lanes
- On-street parking

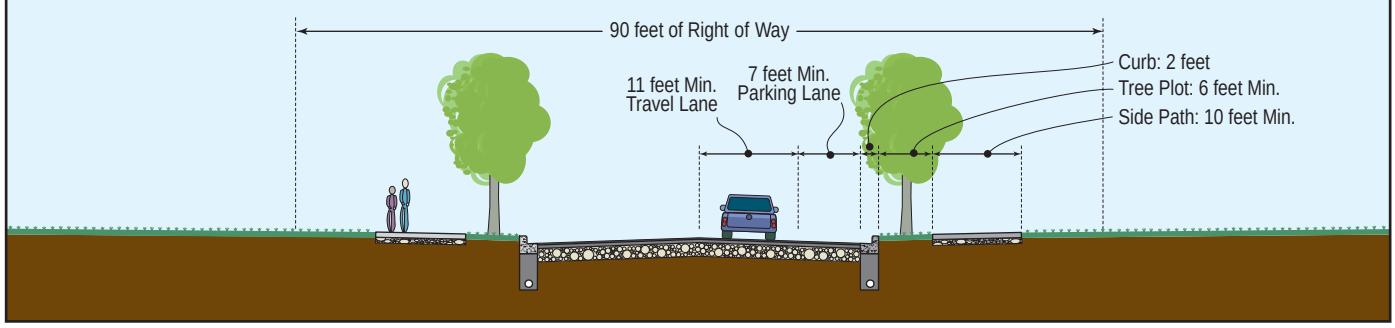
Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- Bicycle lanes
- Signs

North Range Line Road is a unique Collector Street serving residential-scale businesses.

Segments of Spring Mill Road currently serve as a Collector Street, but does not reflect the desired cross section; inclusion of side paths.

Collector Street Typical Cross Section



URBAN COLLECTOR STREET

General Description

An Urban Collector Street is designed to allow direct residential driveway access and allow on-street parking when deemed safe in urban areas. These streets primarily connect Residential Streets with Residential Parkways, Secondary Parkways, Urban Arterials, Secondary Arterials and other Urban Collector Streets.

Street Features

- **Minimum Right-of-Way:** 66 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 7 feet each
- **Minimum Tree Plot:** N/A
- **Street Trees:** Required
- **Buffer Planting:** Tree wells

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Bicycle and pedestrian facilities
- Width of travel lanes
- Sensitive to context
- On-street parking
- Bicycle lanes

Secondary Priorities Within Right-of-Way

- Street trees

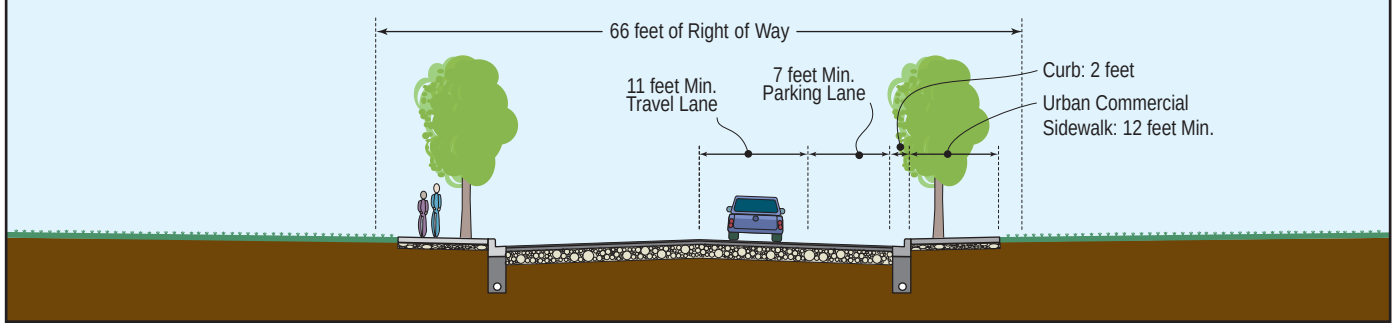
Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- Bicycle lanes
- Signs

West Main Street in Carmel's original business district, offers on-street parking and wide sidewalks.

Redevelopment in Old Town has increased the use of on-street parking. Street trees are added to the streetscape to enhance pedestrian comfort.

Urban Collector Typical Cross Section



RESIDENTIAL PARKWAY

General Description

A Residential Parkway is designed to maintain residential character and to efficiently convey residential traffic to more major roads. Driveway access should be reduced when possible and on-street parking can be permitted when deemed safe. Residential Parkways primarily connect Residential Streets with Collector Streets, Secondary Parkways, Primary Parkways, Secondary Arterials and other Residential Parkways.

Street Features

- **Minimum Right-of-Way:** 100 feet
- **Maximum Number of Lanes:** 2 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 7 feet each
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Neighborhood character
- Sensitive to context
- Bicycle and pedestrian facilities
- Width of tree plots
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

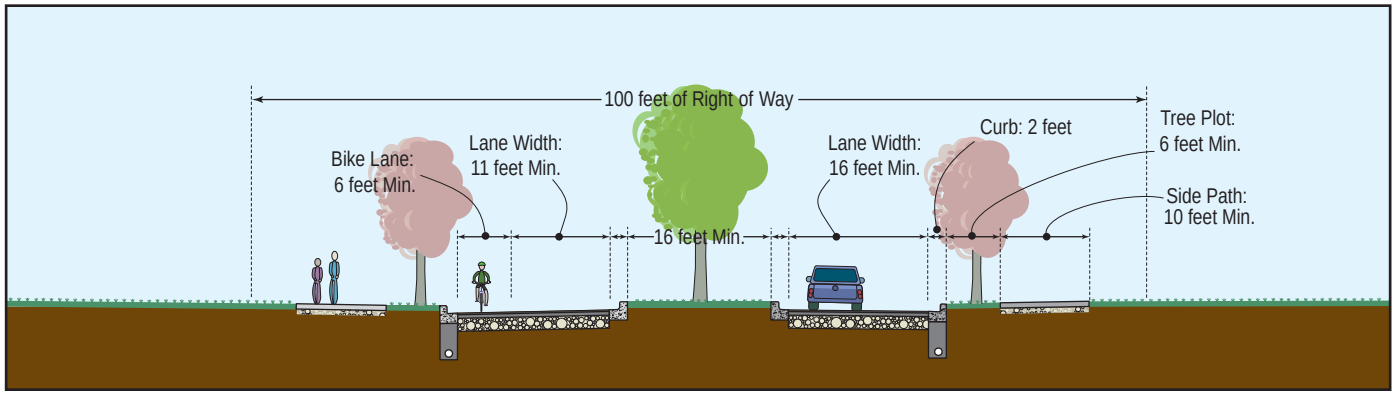
- Width of travel lanes
- On-street parking
- Bicycle lanes

Traffic Management Options

- Roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- Bicycle lanes
- Signs

Recent improvements to Oak Ridge Road typify Residential Parkway design.

Millbrook Parkway provides the residents of Brooks Bend an attractive and safe connection to 99th Street.



SECONDARY PARKWAY

General Description

A Secondary Parkway is equivalent to a Secondary Arterial, but is configured with a median and more aesthetic characteristics. Secondary Parkways primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways and Primary Arterials.

Street Features

- **Minimum Right-of-Way:** 130 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Sensitive to context
- Width of travel lanes
- Bicycle and pedestrian facilities
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

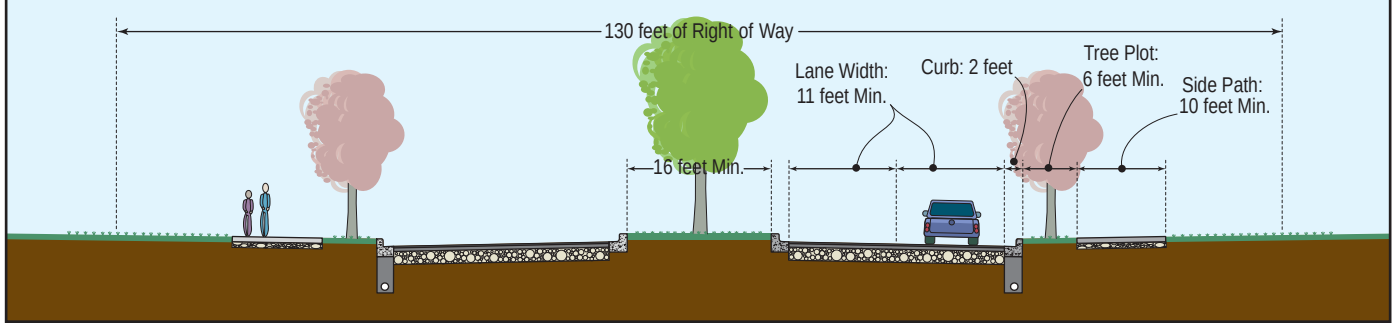
- Bicycle lanes
- Tree plot widths

Traffic Management Options

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Limited median interruption
- Bicycle lanes
- Signs

A recently constructed segment of Illinois Street begins to establish the character of this Secondary Parkway.

Secondary Parkway Typical Cross Section



PRIMARY PARKWAY

General Description

A Primary Parkway is equivalent to a Primary Arterial but is configured with a median and more aesthetic characteristics. Primary Parkways primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 140 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 6 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Sensitive to context
- Width of travel lanes
- Bicycle and pedestrian facilities
- Median planting
- Street trees

Secondary Priorities Within Right-of-Way

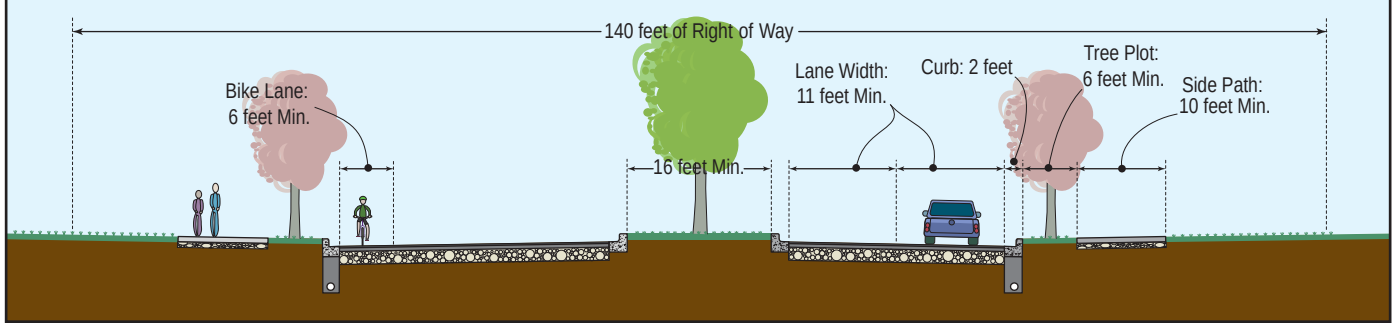
- Bicycle lanes
- Tree plot widths

Traffic Management Options

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Limited median interruption
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- Bicycle lanes
- Signs

Pennsylvania Street provides access to Regional Employment areas on the east side of U.S. 31.

Primary Parkway Typical Cross Section



URBAN ARTERIAL

General Description

An Urban Arterial is equivalent to a Secondary Arterial but is configured to fit within a developed corridor. Urban Arterials primarily connect Residential Streets, Collector Streets, Urban Collectors, Residential Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways. An Urban Arterial is designed to allow limited driveway access and allow on-street parking when deemed safe in urban areas.

Street Features

- **Minimum Right-of-Way:** 90 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Optional on one or two sides; 7 feet each
- **Minimum Tree Plot:** N/A
- **Street Trees:** Required
- **Buffer Planting:** Tree wells

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- Sensitive to context
- Pedestrian facilities
- Bicycle lanes

Secondary Priorities Within Right-of-Way

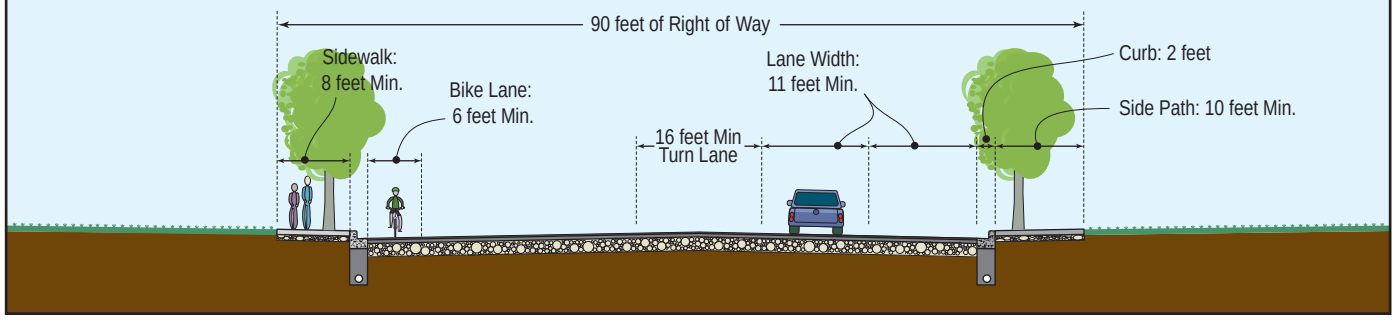
- Street trees in grates
- On-street parking

Traffic Management Options

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- On-street parking
- Narrower lane widths
- Curb extensions at traditional intersections (bump-outs)
- Bicycle lanes
- Signs

South Range Line Road has reasserted itself as a significant commercial corridor providing the main point of entry into the Old Town Arts and Design District from the south.

Urban Arterial Typical Cross Section



SECONDARY ARTERIAL

General Description

A Secondary Arterial is designed to carry heavy volumes of traffic to major destinations in the City. Generally, Secondary Arterials are focused on mitigating traffic in narrow rights-of-way. Secondary Arterials primarily connect Collector Streets, Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 100 feet; 90 feet in areas south of 116th Street and west of Spring Mill Road.
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 8 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- Bicycle and pedestrian facilities

Secondary Priorities Within Right-of-Way

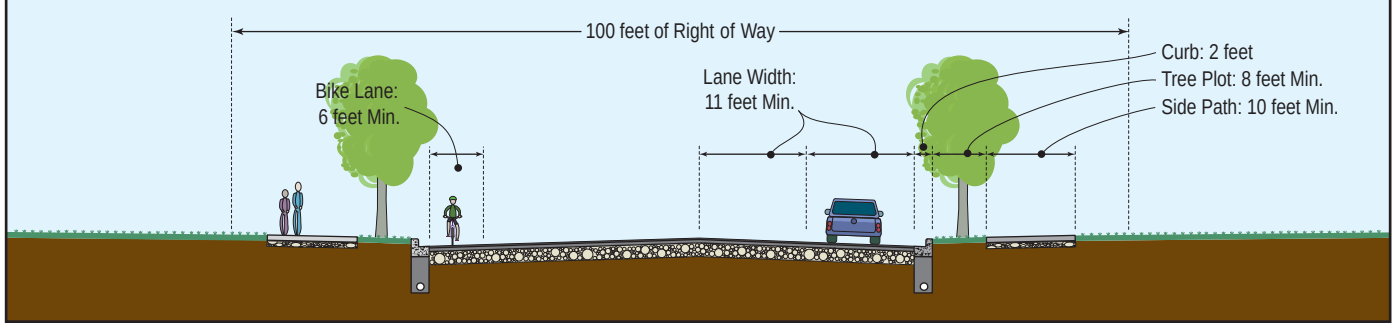
- Sensitive to context
- Street trees
- Bicycle lanes
- Tree plot widths

Traffic Management Options

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- Bicycle lanes
- Signs

East 116th Street east of Keystone Parkway provides off-street facilities for pedestrians and on-street facilities for cyclists and motorists.

Secondary Arterial Typical Cross Section



PRIMARY ARTERIAL

General Description

A Primary Arterial is designed to carry very heavy volumes of traffic to major destinations in or out of the City. Generally, Primary Arterials are focused on mitigating heavy traffic. Primary Arterials mainly connect Residential Parkways, Secondary Parkways, and Secondary Arterials with Primary Parkways, Primary Arterials and Highways.

Street Features

- **Minimum Right-of-Way:** 150 feet
- **Maximum Number of Lanes:** 4 lanes
- **Minimum Lane Width:** 11 feet
- **Curbs:** Required
- **Sidewalks and Paths:** Required as per the Bicycle and Pedestrian Facility Plan
- **On-Street Parking:** Not Permitted
- **Minimum Tree Plot:** 8 feet
- **Street Trees:** Required
- **Buffer Planting:** Required

Typical Cross Section

See illustration below

Primary Priorities Within Right-of-Way

- Width of travel lanes
- Bicycle and pedestrian facilities

Secondary Priorities Within Right-of-Way

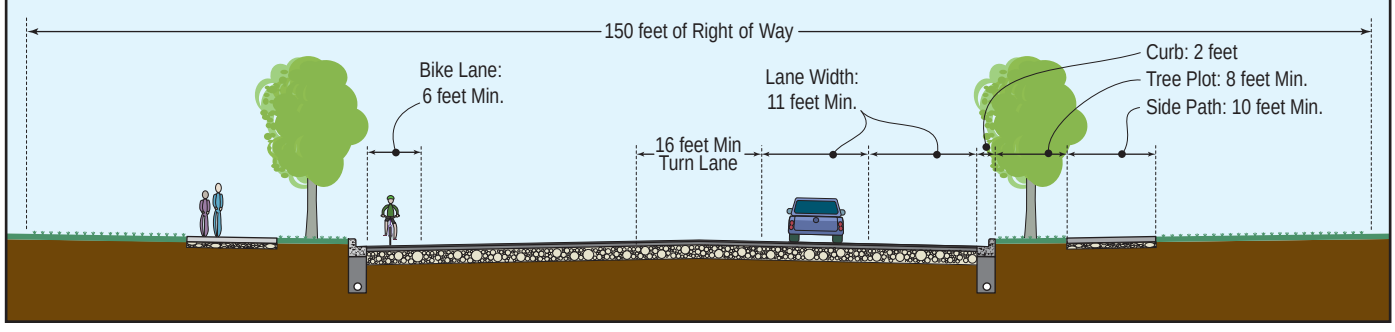
- Sensitive to context
- Street trees
- Bicycle lanes
- Tree plot widths

Traffic Management Options

- Roundabouts
- Defined turn lanes at intersections or roundabouts
- Acceleration and deceleration lanes
- Grade separation at Highways
- Exit ramps at Highways and Interstates
- Bicycle lanes
- Signs

146th Street east of U.S. 31.

Primary Arterial Typical Cross Section



PART 4: TRANSPORTATION PLAN

STREET CLASSIFICATION COMPARISON

The below table provides a quick reference for comparing the different street classifications. The information in the below table mirrors the content in each of the street classification descriptions on the previous pages.

THOROUGHFARE PLAN MAP DESCRIPTION

The Thoroughfare Plan Map (on the next page) applies a street classification to each street in Carmel's planning jurisdiction. The applied street classification represents what the street will evolve to be over the course of 20 years, not as it currently exists.

The Thoroughfare Plan Map also denotes where new streets are necessary to fulfill the *C3 Plan's* goals to mitigate traffic and promote ease of travel by all modes. These new streets should be viewed as mandatory when land is being developed adjacent to or inclusive of the new street's proposed location.

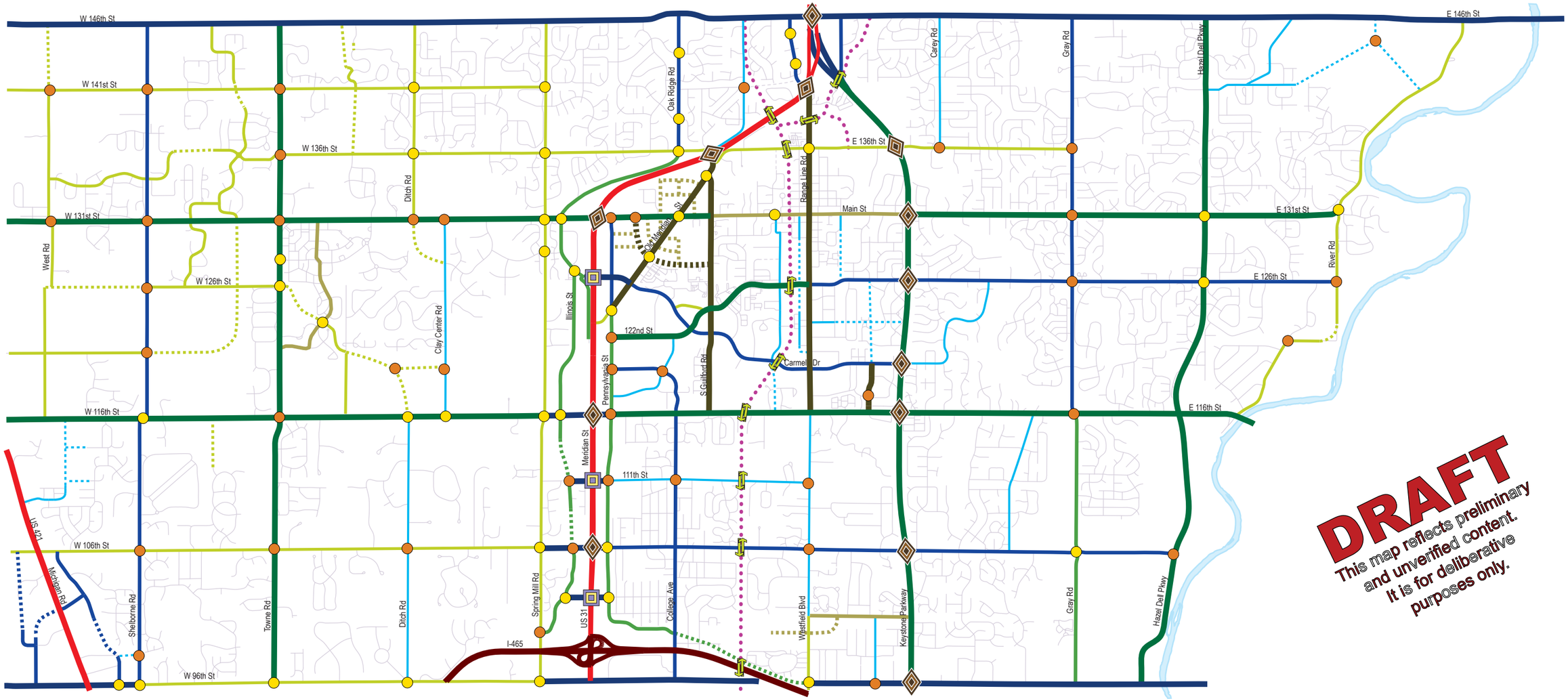
See the Bike and Pedestrian Facilities Plan for non-vehicular facility descriptions.

Street Classification	Minimum Right-of-Way	Maximum Number of Lanes	Minimum Lane Widths	Curbs	On-Street Parking (Minimum Width)	Minimum Tree Plot	Street Trees	Buffering Planting
Residential Street - Lane	40 feet	2	10 feet	Not required	Not permitted	5'	Required	Not required
Residential Street - Minor	50 feet	2	11 feet	Required	Optional on one side (7')	5'	Required	Not required
Residential Street - Major	55 feet	2	11 feet	Required	Optional on one side (7')	5'	Required	Not required
Collector Street	90 feet*	4	11 feet	Required	Optional on one or two sides (7')	6'	Required	Required
Urban Collector Street	66 feet	4	11 feet	Required	Optional on one or two sides (7')	N/A	Required	Tree wells
Residential Parkway	100 feet	2	11 feet	Required	Optional on one or two sides (7')	6'	Required	Required
Secondary Parkway	130 feet	4	11 feet	Required	Not permitted	6'	Required	Required
Primary Parkway	140 feet	4	11 feet	Required	Not permitted	6'	Required	Required
Urban Arterial	90 feet	4	11 feet	Required	Optional on one or two sides (7')	N/A	Required	Tree wells
Secondary Arterial	100 feet*	4	11 feet	Required	Not permitted	8'	Required	Required
Primary Arterial	150 feet	4	11 feet	Required	Not permitted	8'	Required	Required

* When these facilities are within the Southwest quadrant of Clay Township, the applicable right-of-way shall be 10 feet less.

PART 4: TRANSPORTATION PLAN

Thoroughfare Plan Map



DRAFT

This map reflects preliminary and unverified content. It is for deliberative purposes only.

MAP LEGEND

- Interstate
- U.S./State Highway
- Primary Arterial
- Primary Parkway
- Urban Arterial
- Urban Arterial (Proposed)
- Secondary Arterial
- Secondary Arterial (Proposed)
- Secondary Parkway
- Secondary Parkway (Proposed)
- Urban Collector
- Urban Collector (Proposed)
- Residential Parkway
- Residential Parkway (Proposed)
- Collector Street
- Collector Street (New)
- Residential Street
- Residential Street (New)
- Off-Street Commuter Trail
- Grade-Separated Crossing
- Interchange Location
- Overpass Location
- Roundabout Intersection (Existing)
- Roundabout Intersecton (Proposed)
- River

THOROUGHFARE PLAN MAP

1/4 MILE 1/2 MILE 3/4 MILE 1 MILE

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Map Prepared by Ground Rules, Inc. Last Revised 10-21-2008

BICYCLE AND PEDESTRIAN FACILITY PLAN

The City's Bicycle and Pedestrian Facility Plan focuses on facilities for non-motorized transportation. One primary purpose for these facilities is to provide an alternative for people to get where they are going without using their vehicles (i.e. for commuting). As a result, bicycle and pedestrian facilities help mitigate traffic throughout the City while improving the health of residents. Another primary purpose for bicycle and pedestrian facilities is to provide a means for people who cannot drive vehicles (e.g. youth, blind, and seniors) to safely get to local destinations. For this reason, all bicycle and pedestrian facilities are intended to accommodate all handicap accessible devices.

The secondary purpose for bicycle and pedestrian facilities is fitness training and general recreation. People desirous of a healthy life-style need facilities to safely walk, run, skate/blade, or cycle. The City of Carmel realizes not all bicycle and pedestrian facilities are designed for all types of fitness activities (e.g. fitness cycling is not appropriate on sidewalks). Therefore, multiple bicycle and pedestrian facilities may be necessary in the same right-of-way to accommodate different fitness activities.

Bicycle/Pedestrian Facility Classifications and Descriptions

The following bicycle and pedestrian facility classifications are used on the Bicycle and Pedestrian Facility Plan Map:

Each of the bicycle and pedestrian facility classifications listed above has a page dedicated to describing how it can be used to convey bicycle and pedestrian traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each bicycle and pedestrian facility classification:

General Description: This section gives the reader a brief description of why the bicycle and pedestrian facility classification has been established.

Bicycle and Pedestrian Facility Features: This section conveys the primary design standards that make each bicycle and pedestrian facility classification unique. The standards include: right-of-way, minimum facility width, construction material, joints, obstructions, and street separation.

Image Example: This section references images of each bicycle and pedestrian facility classification. The images are intended to portray some of the best examples available in Carmel, but might not represent the purest intent of the facility. When applied in the real world, variations in the design may also be necessary.

Design Priorities: During the design phase of all bicycle and pedestrian facility improvement projects, decisions have to be made to best meet budgetary constraints, timelines, funding cycles, physical constraints, and public opinions. This section communicates the primary and secondary priorities for each bicycle and pedestrian facility classification. Primary priorities are those that should not be foregone in design decisions. Secondary priorities are those that maybe considered for compromise, non-inclusion, or later phases.

Safety Enhancements: This section describes bicycle and pedestrian safety options to consider when installing or improving a facility. The enhancements listed are intended to identify the most appropriate for the subject facility.

RESIDENTIAL SIDEWALK

General Description

A Residential Sidewalk is designed to accommodate the following type of pedestrian activities in suburban neighborhoods:

- walking
- pushing strollers
- children's recreation

Generally, Residential Sidewalks provide connectivity from home to home and linkages to bicycle and pedestrian facilities along perimeter roads (e.g. Side Paths).

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 5 feet
- **Construction Material:** Concrete
- **Joints:** Saw-cut preferred, tooled is permitted
- **Obstructions:** None allowed
- **Street Separation:** 5 to 6-foot tree plot is required

Image Example

See images in right column.

Design Priorities

- **Primary Priorities:**
  - Reinforcing neighborhood character
  - ADA compliance at intersections
  - Unobstructed
- **Secondary Priorities:**
  - Avoid steep slopes
  - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 8 feet of clearance
- Lighting

Sidewalks along Melark Drive in The Enclave of Carmel provide pedestrian access to neighboring Concord Village.

Care should be taken to avoid or remove obstructions to provide a safe pedestrian way.

Birchwood Court illustrates a proper relationship of street, planting strip, and sidewalk.

URBAN RESIDENTIAL SIDEWALK

General Description

An Urban Residential Sidewalk is designed to accommodate the following type of pedestrian activities in urban neighborhoods:

- walking
- pushing strollers
- children's recreation

Generally, Urban Residential Sidewalks provide connectivity from home to home and linkages to bicycle and pedestrian facilities along perimeter roads (e.g. Side Paths) or Urban Commercial Sidewalks.

Because separation from the street is preferred, this type of facility is not encouraged in new subdivisions or developments.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 6 feet
- **Construction Material:** Concrete, brick or hardscape pavers
- **Joints:** Not applicable, but saw-cut is preferred for concrete sidewalks
- **Obstructions:** Street lights, street signs, and trees may be located in the sidewalk as long as 5 feet of clear-way is maintained in all sections
- **Street Separation:** Not required

Image Example

See images in right column.

Design Priorities

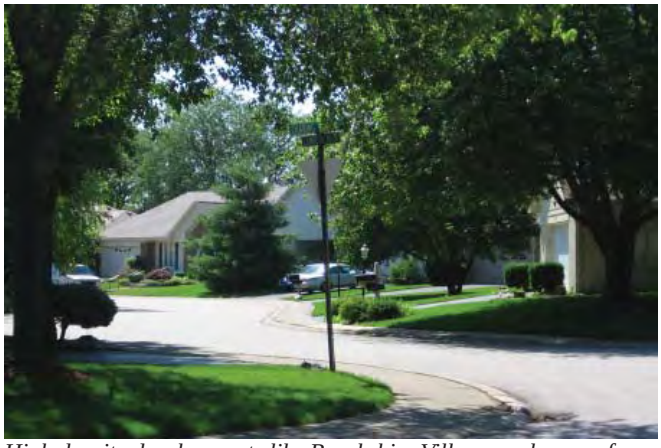
- **Primary Priorities:**
  - Reinforcing neighborhood character
  - ADA compliance at intersections
  - Street trees
- **Secondary Priorities:**
  - Unobstructed
  - Avoid steep slopes
  - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 8 feet of clearance
- Lighting

Urban Residential Sidewalks are particularly suited to historic neighborhoods.

The Urban Residential Sidewalk on First Street NW in Old Town provides pedestrian access to Range Line Road.



High density developments like Brookshire Village make use of Urban Residential Sidewalks.

URBAN COMMERCIAL SIDEWALK

General Description

An Urban Commercial Sidewalk is designed to accommodate the following type of pedestrian activities in urban settings:

- walking
- sitting on benches
- outdoor dining
- pushing strollers

Generally, Urban Commercial Sidewalks provide connectivity from business to business and linkages to other pedestrian facilities along perimeter roads (e.g. Side Paths) or Urban Residential Sidewalks.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 10 feet, 12 feet preferred
- **Construction Material:** Concrete, brick or hardscape pavers
- **Joints:** Not applicable, but saw-cut is preferred for concrete sidewalks
- **Obstructions:** Street lights, street signs, planters, trees, public art, and seating may be located on the sidewalk as long as 5 feet of clear-way is maintained in all sections
- **Street Separation:** Not required

Image Example

See images in right column.

Design Priorities

- **Primary Priorities:**
  - Reinforcing commercial character
  - ADA compliance at intersections
  - Variation in construction materials
  - Street trees
- **Secondary Priorities:**
  - Unobstructed
  - Avoid steep slopes

Safety Enhancements

- Striped crosswalks
- Change in pavement material at corners
- Saw-cut joints
- Tree canopy trimmed to give at least 8 feet of clearance
- Lighting
- Tabled (raised) crosswalks

Redevelopment along West Main Street incorporates Urban Commercial Sidewalks.

The Urban Commercial Sidewalks in Clay Terrace are an integral part of the life-style center's design concept.

SIDE PATH

General Description

A Side Path is designed to accommodate the following type of bicycle and pedestrian activities along collector, parkway and arterial streets:

- walking
- jogging
- pushing strollers
- children recreation
- skating/blading
- slow to moderate speed cycling
- commuting

Generally, Side Paths provide connectivity from neighborhood to neighborhood and linkages to community amenities (e.g. Parks and Neighborhood Service Nodes).

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 10 feet
- **Construction Material:** Asphalt or saw-cut concrete
- **Joints:** Not applicable for asphalt, but concrete must have saw-cut joints
- **Obstructions:** None allowed
- **Street Separation:** Minimum of 8 feet

Image Example

See images in right column.

Design Priorities

- **Primary Priorities:**
  - Unobstructed
  - Use slight curves to avoid obstructions
  - Positive drainage away from Side Path
  - Placement on both sides of the street
  - ADA compliance at intersections
- **Secondary Priorities:**
  - Reinforcing local character
  - Avoid steep slopes

Safety Enhancements

- Striped crossings at streets and major curb cut intersections
- Signs for bicycles, pedestrians and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at bicycle or pedestrian approaches to major streets or mid-block crossings.
- Lighting

Recent upgrades to 106th Street in Home Place include a Side Path link to the Monon Greenway.

Side Paths were installed when Oak Ridge Road was transformed to a Residential Parkway.

ON-STREET BICYCLE LANE

General Description

An On-Street Bicycle Lane is designed to accommodate the following bicycle activities along existing roadways:

- commuting
- fitness cycling
- recreation cycling

Generally, On-Street Bicycle Lanes are intended to provide a safer facility for fast-moving bicycle traffic.

Facility Features

- **Right-of-Way:** Fully within a public right-of-way
- **Minimum Facility Width:** 6 feet
- **Construction Material:** Asphalt
- **Joints:** Not applicable
- **Obstructions:** None allowed
- **Street Separation:** By painted strip

Image Example

See images in right column.

Design Priorities

- **Primary Priorities:**
  - Lane definition
  - Information and traffic signs
  - Unobstructed
  - Placement on both sides of street
  - Positive drainage away from On-Street Bicycle Lane
- **Secondary Priorities:**
  - Lighting
  - Avoid steep slopes
  - Avoid unnecessary curvature of alignment

Safety Enhancements

- Striped lanes (not raised markings) at street intersections
- Smooth transitions from asphalt to curb
- Street sweep sand, stones and debris from bicycle lanes
- Lighting
- Storm water inlet orientation and product selection
- Separation between parallel parking and bicycle lanes
- Bicycle signals
- Bicycle boxes at intersections to allow bicyclists to navigate the intersection more safely and ahead of automobile movements.

East 116th Street east of Keystone Parkway was among the first streets in Carmel to have a designated bike lane.

On-Street Bicycle Lanes help ensure cyclist safety by defining limits for motorists.

OFF-STREET URBAN TRAIL

General Description

An Off-Street Urban Trail is designed to accommodate the following bicycle and pedestrian activities along highly traveled areas near City Center and Old Town.

- walking
- jogging
- commuting
- pushing strollers
- children recreation
- skating/blading
- slow to moderate speed cycling

Generally, Off-Street Urban Trails provide recreational, fitness and commuting opportunities in both urban and natural settings.

Facility Features

- **Right-of-Way:** May be in a right-of-way, easement or public park; 66 feet in width
- **Minimum Facility Width:** 24 feet
- **Construction Material:** Asphalt, saw-cut concrete or other suitable surface
- **Joints:** Any concrete must have saw-cut joints
- **Obstructions:** None allowed
- **Street Separation:** Not applicable

Image Example

See images in right column.

Design Priorities

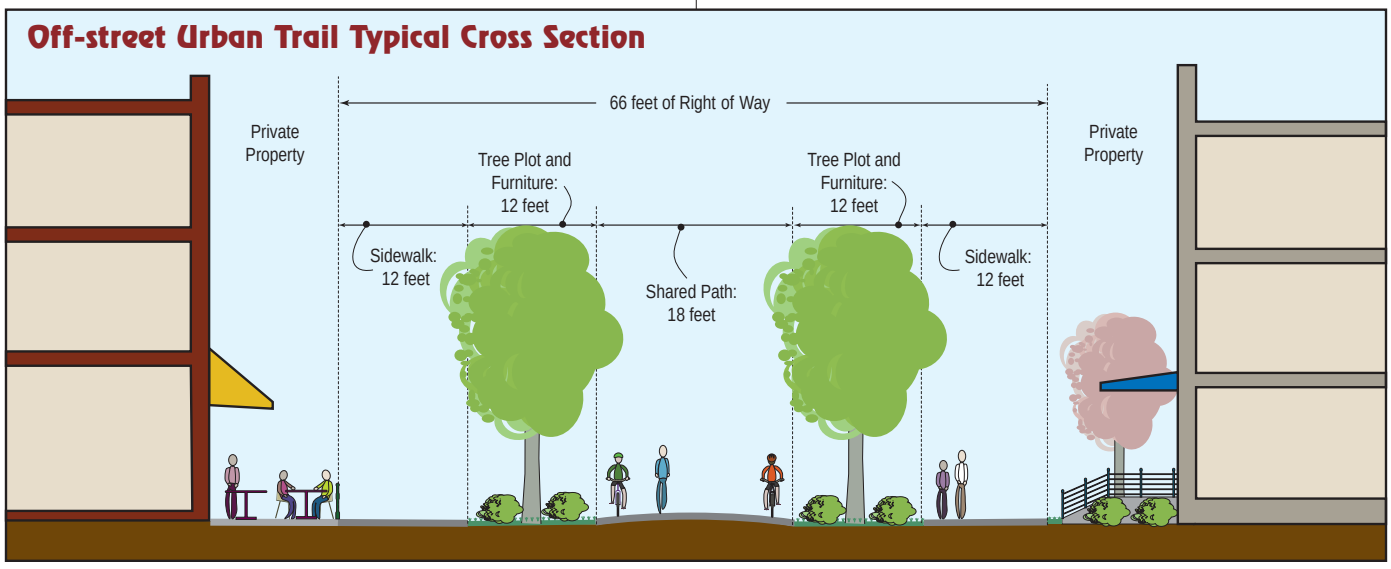
- **Primary Priorities:**
  - Unobstructed
  - Separate bicycle and pedestrian lanes
  - Minimize disturbance to sensitive natural features
  - Landscaping
  - Wayfinding signs
  - Bicycle parking areas
- **Secondary Priorities:**
  - User comforts such as plazas, benches, water fountains, and public art
  - ADA compliance at intersections
  - Avoid steep slopes

Safety Enhancements

- Striped crossings at street intersections
- Raised crossings at intersections
- Separated grade crossings
- Signs for trail users and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at trail approaches to major streets or mid-block crossings
- Lighting at intersections

The Monon Greenway passes through Old Town, providing pedestrians and cyclists access to this increasingly popular destination.

Off-street Urban Trail Typical Cross Section



OFF-STREET TRAIL

General Description

An Off-Street Trail is designed to accommodate the following type of bicycle and pedestrian activities along natural or off-street corridors.

- walking
- jogging
- commuting
- pushing strollers
- children recreation
- skating/blading
- slow to moderate speed cycling

Generally, Off-Street Trails provide recreation and fitness opportunities as well as a thoroughfare in natural settings.

Facility Features

- **Right-of-Way:** Not in a street right-of-way, but within an easement, floodplain or public park; 66 feet in width
- **Minimum Facility Width:** 16 feet total with a 12 foot wide trail and 2 foot shoulder
- **Construction Material:** Asphalt, crushed limestone or other suitable surface
- **Joints:** Not applicable
- **Obstructions:** None allowed
- **Street Separation:** Not applicable

Image Example

See images in right column.

Design Priorities

- **Primary Priorities:**
  - Unobstructed
  - Minimize disturbance to sensitive natural features
  - Reflect natural character
  - Use curves to avoid obstructions
  - Positive drainage away from Off-Street Trail
  - Bicycle parking areas
- **Secondary Priorities:**
  - ADA compliance at intersections
  - Avoid steep slopes

Safety Enhancements

- Striped crossings at street intersections
- Signs for bicycles, pedestrians and automobiles at intersections
- Smooth transitions from Off-Street Trail to street surface at intersections
- Bollards or chicane gates at pedestrian approaches to major streets or mid-block crossings
- Grade-separated crossings
- Lighting at intersections

The Monon Greenway provides access and continuity between Carmel's and Indianapolis' trail systems.

Off-Street Trails have been provided in several parks, like the one in West Park.

BICYCLE AND PEDESTRIAN FACILITY CLASSIFICATION COMPARISON

The below table provides a quick reference for comparing the different bicycle and pedestrian classifications. The information in the below table mirrors the content in each of the bicycle and pedestrian facility classification descriptions on the previous pages.

Bicycle and Pedestrian Facility Classification	Right-of-Way	Minimum Facility Width	Construction Material	Joints	Obstructions	Street Separation
Residential Sidewalk	Fully within a public right-of-way	5'	Concrete	Saw-cut preferred, tooled permitted	None allowed	6' tree plot required
Urban Residential Sidewalk	Fully within a public right-of-way	6'	Concrete, brick or hardscape pavers	N/A but saw-cut preferred for concrete	Street lights, street signs and trees may be located in the sidewalk as long as 5' of clear-way is maintained	Not required
Urban Commercial Sidewalk	Fully within a public right-of-way	10' (12' preferred)	Concrete, brick or hardscape pavers	N/A but saw-cut preferred for concrete	Street lights, street signs and trees may be located in the sidewalk as long as 5' of clear-way is maintained	Not required
Side Path	Fully within a public right-of-way	10'	Asphalt or saw-cut concrete	N/A but concrete must be saw-cut	None allowed	Minimum 8'
On-Street Bicycle Lane	Fully within a public right-of-way	6'	Asphalt	N/A	None allowed	By painted strip
Off-Street Urban Trail	Right-of-way, easement or public park	24'	Asphalt, saw-cut concrete or other suitable surface	Concrete must be saw-cut	None allowed	Not required
Off-Street Trail	Not in a street right-of-way, but within an easement, floodplain or public park	16' total with 12' trail and 2' shoulder	Asphalt, crushed limestone or other suitable surface	N/A	None allowed	N/A

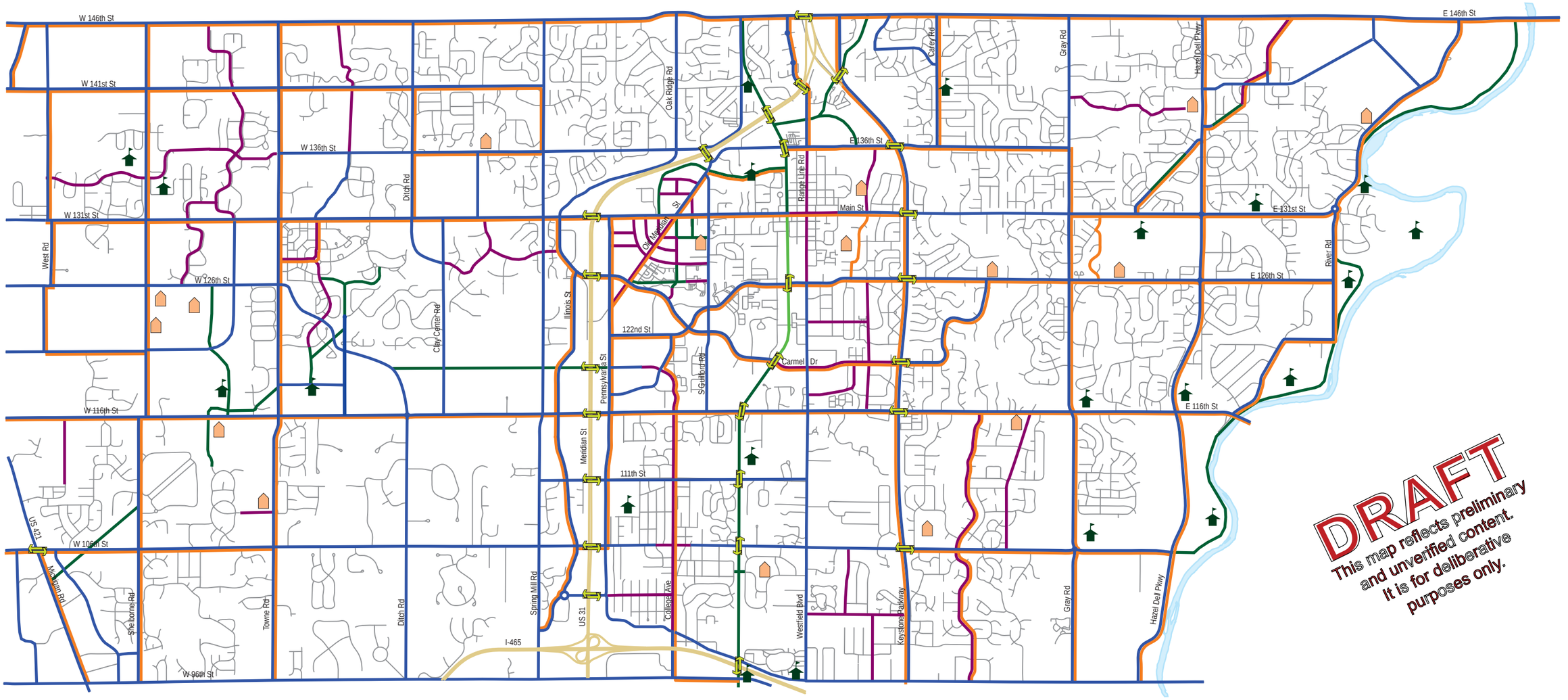
BICYCLE AND PEDESTRIAN PLAN MAP

The Bicycle and Pedestrian Plan Map (on page 75) applies the bicycle and pedestrian facility classifications throughout Carmel's planning jurisdiction. The bicycle and pedestrian facility classifications represent the future system, not what exists today.

The Bicycle and Pedestrian Plan Map is used to denote where new bicycle and pedestrian facilities are necessary to fulfill the *C3 Plan's* goals to mitigate traffic and promote ease of travel by all modes. These bicycle and pedestrian facilities should be viewed as mandatory when land is being developed adjacent to or inclusive of the new facility's proposed location.

See the Thoroughfare Plan for vehicular facility descriptions.

Bicycle and Pedestrian Plan Map



DRAFT
This map reflects preliminary and unverified content. It is for deliberative purposes only.

MAP LEGEND

- Urban Off-street Trail
- Off-street Trail
- Bicycle Route or Lane
- Side Path
- Enhanced Sidewalk
- Sidewalk
- Corridor without Bicycle or Pedestrian Facility
- Grade-separated Crossing
- School Location
- Park Location
- River

BICYCLE AND PEDESTRIAN PLAN MAP

1/4 MILE 1/2 MILE 3/4 MILE 1 MILE

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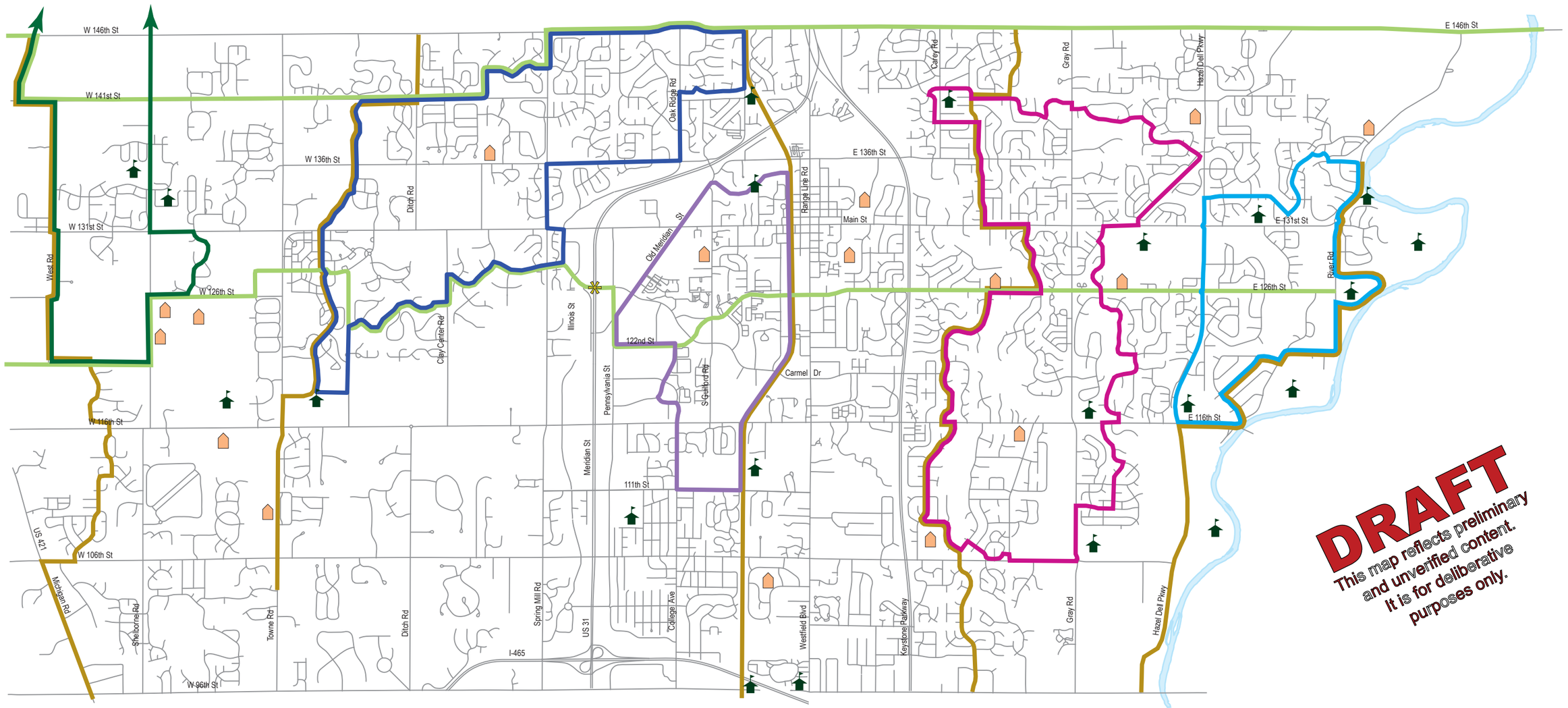
Map Prepared by Ground Rules, Inc. Last Revised 11-12-2008

Bicycle Routes and Loops Plan Map



MAP LEGEND

- West Loop
- Village Loop
- City Center Loop
- Cool Creek Loop
- White River Loop
- East/West Route
- North/South Route
- Future Route
- School
- Park
- Parking
- Difficult Crossing
- White River

BICYCLE ROUTES AND LOOPS MAP

1/4 MILE | 1/2 MILE | 3/4 MILE | 1 MILE

N

Map Prepared by Ground Rules, Inc. Last Revised 10-21-2008

PART 4: TRANSPORTATION PLAN

TRANSIT PLAN

The City is actively in pursuit of a means to convey commuters between key locations in Carmel, Hamilton County, and Indianapolis. The City also has interest in an intra-city system to allow people to travel between key destinations in the City without using their own automobile. The primary purpose of these interests is to mitigate traffic on arterial streets and highways. The accomplishment of a regional commuter line and intra-city system would also help nurture the integrity of the natural environment by reducing emissions and consumption of petroleum products.

It is suggested that a commuter line can not only mitigate traffic congestion, but can reduce commute times to downtown. Collectively, these benefits are expected to make a commuter line an attractive option for those who work in downtown Indianapolis but live in Carmel or vice versa.

A secondary purpose for a commuter line and intra-city system is to provide accessibility to disabled persons, youth, seniors, and others who cannot or do not wish to drive.

Many factors contribute to the viability of any transit system. For instance, the cost of gasoline influences potential ridership, thus the revenue stream. Other factors include:

- gross residential population of the communities being served,
- density of population near transit station,
- number of workers and residents within a 5 minute walk of a transit station,
- design of the system (e.g. raised or at-grade),
- cost per ride,
- percent of system being subsidized by the government,
- convenience of system (e.g. transit stations near desired destination),
- frequency of transit vehicles (i.e. wait time for boarding),
- actual and perceived degree of safety and security,
- time riding transit verses driving car, and
- availability of parking areas.

This section of the *C3 Plan* is intended to explore transit opportunities to meet the needs of a developing and redeveloping community. It is not intended to encourage high density for the sake of establishing a transit system.

Transit Facility Classifications and Descriptions

The following transit classifications are used on the Transit Plan Map:

Each of the transit facility classifications listed above has a page dedicated to describing how it can be used to mitigate traffic and how it fits into the fabric of the City. Further, the following headings are used, as described below, to convey the essence of each transit facility classification:

General Description: This section gives the reader a brief description of why the transit classification has been established.

Design Priorities: This section conveys the primary design standards that should apply to each type of transit to make it successful.

COMMUTER LINE

General Description

A Commuter Line would be designed to carry a large number of people from key locations in Carmel to one or more destinations in downtown Indianapolis. Additional stops en route to downtown Indianapolis may also be necessary.

The interim express bus system should continue to be supported and enhanced to mitigate traffic and provide familiarity with commuter systems.

Currently the type of commuter line (e.g. raised monorail or light rail) has not been conceptualized, nor has any engineering or comprehensive study been completed to choose a route into Carmel. Extensive study should be conducted to determine an exact route, station locations, scheduling, ridership, cost, phasing, ties to other alternative transportation, and type of "vehicle" to use. For that reason this section is primarily a placeholder for revisions and additions as further study is conducted. Everything contained in this section should be considered conceptual and preliminary.

Design Priorities

- Commuter stops should take the form of stations with shelters, waiting areas, and bicycle parking.
- Stations in Carmel should be located in areas with intense employment and large parking capacity, or dense populations living within walking distance.
- Destinations for commuters to include Keystone at the Crossing and downtown Indianapolis.
- "Express" commute time to downtown Indianapolis.
- "Vehicles" should provide the space for passengers to transport their bicycles.

MetroLink in St. Louis is an example of light rail. The electric powered system uses overhead power lines for energy.

The Clarian People Mover was installed in Indianapolis to better link hospital campuses to one another. This system represents an automated and raised rail system.

The Indianapolis Metropolitan Planning Office uses the above image to describe an at-grade automated rail system. The location of the system is unknown.

INTRA-CITY TRANSPORTATION SYSTEM

General Description

A Intra-city Transportation System would be designed to carry a moderate number of people between key locations in Carmel. Additional routes may include key locations in Zionsville, Noblesville, Indianapolis, Westfield and/or Fishers. Most likely, this system would be a driver-operated, on-street system.

Currently the type of Intra-city Transportation System (e.g. trolly or bus) has not been conceptualized, nor has any comprehensive study been conducted to determine an on-street system of routes and stops. Extensive study should be conducted to determine potential routes, stops, scheduling, ridership, cost, phasing, ties to other alternative transportation, and type of vehicles. For that reason this section is primarily a placeholder for revisions and additions as further study is conducted. Everything contained in this section should be considered conceptual and preliminary.

Design Priorities

- Intra-city stops should take the form of "turnouts" to provide safe ingress and egress from the vehicle.
- Turnouts in Carmel should be located at popular destinations like Old Town, City Center, Clay Terrace, U.S. 31 office parks, Merchants' Square, Central Park, and strategic locations near higher density residential developments.
- Convenience of schedule and efficiency in time.
- User-friendly and predictable.
- Driver operated.

The New Flyer brand hybrid electric bus represents the latest technology in low floor (for easy in and out) and low emission transit vehicles. Buses like this could match Carmel's commitment to a fleet of fuel efficient and low emissions vehicles.

Some communities desire themed buses so riders can quickly recognize them and to fit better into the context. This trolly bus is used in Central Park in New York City.

Compact buses, like this one used in Long Beach, California, provide lower up-front cost and are more maneuverable in urban environments.

TRANSIT FACILITY PLAN

A Transit Facility Plan should be prepared to identify potential routes using key corridors. The transit facility plan would also identify high density or intense nodes that would benefit from a transit stop. Once prepared the Transit Facility Plan can help promote proper development where transit stops will most likely be located, and to discourage incompatible land uses from locating adjacent to routes or near transit stops.

The Transit Facility Plan Map, when prepared, should be located on the following page.